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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/656,821	09/05/2003	Michael Paul Tankard	K315.131.101	9414

25281 7590 06/03/2005

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EXAMINER	
MCCLOUD, RENATA D	

ART UNIT	PAPER NUMBER
2837	

DATE MAILED: 06/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

EJC

Office Action Summary	Application No.	Applicant(s)	
	10/656,821	TANKARD, MICHAEL PAUL	
	Examiner	Art Unit	
	Renata McCloud	2837	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 March 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 September 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *02/02/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. Figure 7 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-5,12-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Webster (US5847532).

Claim 1: a circuit comprising a plurality of switches (Fig. 3: 14,16; Fig. 4: 44,46,48, 50) connecting a phase winding (L1/L2) to a supply (Vs), the switches comprising a first set (A) and a second set (B) for supplying current to the phase

winding and returning current to the supply, the switches of the first and second set conducting current in both a first and a second direction (col. 1:59-2:2; Col. 3:60-4:13) and the switches of the first set being rated higher than the switches of the second set (col. 2:65-3:7).

Claim 2: the circuit is arranged during a motor mode to supply current to the phase windings via the first set and provide a path for returning current to the supply via the second set, and in a generator mode to supply current to the phase winding via the second set and return current to the supply via the first set (Col. 5:61-65, the drive is used as a motor or a generator in relation to which energy is being delivered to or taken from the load, and it is inherent that a current flows in one direction during motoring and reversely when generating).

Claim 3: the direction of the current in the phase winding in the motor mode is opposite the direction in the generator mode (Col. 5:61-65, the drive is used as a motor or a generator in relation to which energy is being delivered to or taken from the load, and it is inherent that a current flows in one direction during motoring and reversely when generating).

Claim 4: the switches are capable of operating as a diode (14,16 the switches are capable of operating as a diode, as the recitation "capable is broad so it does not require the reference to explicitly teach such, but only requires the ability to so perform').

Claim 5: a switch has an inherent integral reverse diode (Fig.4: 44,46,48,50, col. 4:55-67).

Claim 8: there are four switches (14,16) and the first set (A) comprises two switches (14,16) rated higher than the remaining two forming a second set (col. 2:65-3:7).

Claims 12, 14, and 15: motor comprising a plurality of rotor poles, a stator having a plurality of stator poles (Fig. 1) and a circuit comprising a plurality of switches (Fig. 3: 14,16) connecting a phase winding (L1/L2) to a supply (Vs), the switches comprising a first set (A) and a second set (B) for supplying current to the phase winding and returning current to the supply, the circuit is arranged during a motor mode to supply current to the phase windings via the first set and provide a path for returning current to the supply via the second set, and in a generator mode to supply current to the phase winding via the second set and return current to the supply via the first set (Col. 5:61-65, the drive is used as a motor or a generator in relation to which energy is being delivered to or taken from the load, and it is inherent that a current flows in one direction during motoring and reversely when generating) and the switches of the first set being rated higher than the switches of the second set (col. 2:65-3:7).

Claim 13: the direction of the current in the phase winding in the motor mode is opposite the direction in the generator mode (Col. 5:61-65, the drive is used as a motor or a generator in relation to which energy is being delivered to or taken from the load, and it is inherent that a current flows in one direction during motoring and reversely when generating).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Webster in view of Morris (US 6137256).

Claim 6: Webster teaches the limitations of claim 4. Referring to claim 6, Webster discloses the claimed invention except for the switches being MOSFETS. Morris teaches that it is known in the art to provide MOSFETs (Col. 3:37-40). It would have been an obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus taught by Webster to use MOSFETs as taught by Morris since Morris states at col. 3 lines 37-40 that such a modification accomplish switching of the windings.

Claim 7: Webster teaches the limitations of claim 1. Referring to claim 7, Webster discloses the claimed invention except for the switches being MOSFETs. Morris teaches that it is known in the art to provide MOSFETs (Col. 3:37-40). It would have been an obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus taught by Webster to use MOSFETs as taught by Morris since Morris states at col. 3 lines 37-40 that such a modification accomplish switching of the windings

6. Claims 6,7, 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Webster in view of Ramarathnam (US 6316895).

Claim 6: Webster teaches the limitations of claim 4. Referring to claim 6, Webster discloses the claimed invention except for the switches being MOSFETS. Ramarathnam teaches that it is known in the art to provide MOSFETs (Col.5: 66-6:10). It would have been an obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus taught by Webster to use MOSFETs as taught by Ramarathnam since Ramarathnam states at col. 5, line 66- col. 6, line10 that such a modification would accomplish insulated gate switching of the windings.

Claim 7: Webster teaches the limitations of claim 1. Referring to claim 7Webster discloses the claimed invention except for the switches being MOSFETS. Ramarathnam teaches that it is known in the art to provide MOSFETs (Col.5: 66-6:10). It would have been an obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus taught by Webster to use MOSFETs as taught by Ramarathnam since Ramarathnam states at col. 5, line 66- col. 6, line10 that such a modification would accomplish insulated gate switching of the windings.

Claim 9: Webster teaches the limitations of claim 1. Referring to claim 9, Webster teaches that the principles of the invention maybe used in relation to two parts of the same winding on a single pole. Webster does not explicitly disclose the circuit comprises a first switch connected between a first end of the winding and a first voltage rail, a second switch connected between the first end of the winding and a second

voltage rail, a third switch between a second end of the winding and the first voltage rail, and a fourth switch connected between the second end and the second rail the first and fourth switches forming a set. Ramarathnam teach a first switch (Q1) connected between a first end of the winding and a first voltage rail, a second switch (Q2) connected between the first end of the winding and a second voltage rail, a third switch (Q3) between a second end of the winding and the first voltage rail, and a fourth switch (Q4) connected between the second end and the second rail the first (Q1) and fourth (Q4) switches forming a set. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Webster to have the H-bridge arrangement of Ramarathnam. The advantage of this would be the ability to use the apparatus with a single-phase single pole motor.

Claim 10: Webster and Ramarathnam teach the limitations of claim 9. Referring to claim 10, Ramarathnam teach the second (Q2 and third (Q3) switches form the second set.

Claim 11: Webster teaches the limitations of claim 1. Referring to claim 11 Webster discloses the claimed invention except for the switches being MOSFETS. Ramarathnam teaches that it is known in the art to provide MOSFETs (Col.5: 66-6:10). It would have been an obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus taught by Webster to use MOSFETs as taught by Ramarathnam since Ramarathnam states at col. 5, line 66- col. 6, line10 that such a modification would accomplish insulated gate switching of the windings.

Response to Arguments

7. Applicant's arguments with respect to claims 1-15 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Renata McCloud whose telephone number is (571) 272-2069. The examiner can normally be reached on Mon.- Fri. from 8 am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Martin can be reached on (571) 272-2800 ext. 4. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Renata McCloud
Examiner
Art Unit 2837

RDM

MARLON T. FLETCHER
PRIMARY EXAMINER